Application No.: 09/841,698
Amendment dated: March 1, 2006
Reply to Office Action of December 1, 2005
Attorney Docket No.: 41685-136 (IMCK-041)

REMARKS

Claims 1, 2, 4-12, and 14-24 are currently pending in the present application, all of which have been variously rejected under 35 USC §112 and §103 in the Office Action dated December 1, 2005. Claims 1 and 11 are the only independent claims.

Rejections under 35 USC §112

The Office Action acknowledges (*Office Action* p. 2, §1) that the Applicant's prior arguments over came earlier rejections based on 35 USC §102 and §103. However, the Office Action rejected all of claims 1, 2, 4-12, and 14-24 under §112.

With respect to independent claims 1 and 11, the Office Action states that the following element in each of claims 1 and 11 is not taught:

> wherein the expansion section interacts with an action
> dictionary of synonyms that includes a list of "verb-noun"
> expressions that are synonymous with other verbs
>
> *Office Action* pp. 2-3, §3

The Office Action more specifically states that "The Examiner is unable to locate where the 'verb-noun' expressions are synonymous with other verbs." (emphasis added)

With respect to the above, we direct the Examiner's attention to paragraph [0026], which is given context by FIG. 3 and related paragraphs [0023], [0024], [035], [0040] and [0043]. Paragraph [0026] describes and gives parenthetical examples of one of six lists within "action dictionary 140" used by the action expansion module 180 of FIG. 3, and describes the *verb-noun* list as follows:

> [0026] List of "verb-nouns" expressions synonymous with
> other verb (heat-increase temperature-rise temperature,
> etc.)
>
> (emphasis added)

The specification supports the verb-noun list element of independent claims 1 and 11 discussed above, as evidenced in the above passages. Accordingly, the written

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description requirement of §112, first paragraph, is met and Applicant requests removal of the rejections to claims 1, 2, 4-12, and 14-24 under §112.

Rejections under 35 USC §103(a)

The Office Action rejects claims 1, 2, 4-12, and 14-24 under §103(a) based on US Pat. No. 5,895,464 to Bhandari et al. in view of US Pat. No. 6,246,977 to Messerly et al, as "analogous art in that they are related to query expansion." (see *Office Action* p. 3, §§6-7)

<u>Claims 1 and 11</u>

In short, the Office Action asserts that Bhandari teaches each element of claims 1 and 11, but lacks the following portion of the *expansion section* element of claim 1 and *expanding* element of claim 11:

> wherein the expansion section interacts with an action
> dictionary of synonyms that includes a list of "verb-noun"
> expressions that are synonymous with other verbs

However, the Office Action asserts that Messerly teaches this element.

Improper Combination of References

Bhandari teaches "using natural language for the description, search and retrieval of multi-media objects." (see *Bhandari* Abstract). In its Background, Bhandari discusses how techniques used in "document retrieval applications where large amounts of text is available" are limited in a way that make them "unsuitable for applications that contain sparse amount of text to describe and image." Moving in a different direction, Messerly teaches a document retrieval system that utilizes the abundance of words in documents for information retrieval. There is no motivation to combine these references. In fact, Bhandari teaches away from Messerly in that Bhandari states that techniques used in text abundant document retrieval is unsuitable for the image retrieval taught in Bhandari. Accordingly, the Applicant respectfully requests removal of the rejections under §103, as

there is no motivation to combine these references and neither of these alone teach each and every element of claims 1 or 11, or their dependent claims.

Bhandari

In addition to the above, Bhandari does not teach significant portions of claims 1 and 11. Specifically, Bhandari does not teach the *expansion section* or *validation section* of claim 1, nor the corresponding elements of claim 11. Bhandari teaches an image specific system and method using a relatively unstructured database for analysis. Bhandari requires that words be assigned predefined "roles" – and relies on these roles to permit searching. The present invention does not assign or require "roles" be assigned to words to enable searching or retrieval and Bharandi does not teach searching or reterieval without it.

As is evident throughout the present application, and as indicated in the FIELD OF INVENTION thereof, the present invention relates to "narrowing searches." This procedure is performed based on validation of the expanded search queries by means of validation section. The expansion section of claim 1 enables expanded search queries having SAO structure (see example in *Present Application* [0059]-[0063]), that are then used by validation section (see *Present Application* [0064], [0067]) to delete the expanded search queries which are non-valid within the limited pre-built SAO KB. Such pre-build SAO KB is proposed to be prepared automatically from natural language texts (see *Present Application* [0007], [0044], [0049]). For example, according to the provided example (see *Present Application*, [0066]), the expanded query ACTION= "emit"+OBJECT = "magnetic film" is non-valid and removed from list of expanded queries, and thus not used for searching in external information sources (see *Present Application* [0065]) because it cannot be found in a pre-built SAO KB. Thus the resulting search in the external sources is narrowed and better focused by the expansion section and validation section of claim 1, in a manner not made obvious by Bhandari.

Because Bhandari uses the WordNet dictionary, especially its part with word-to-word synonyms of nouns, verbs, adjectives and adverbs (see *Bhandari* Col. 7, lines 18-

20, 24-25) and a-kind-of part of WordNet (see *Bhandari* Col. 7, lines 29-30) to expand

(see *Bhandari* Col. 7, line 12-16) the query, but it provides no validation of expanded

combination of query words. This means, that non-valid combinations (e.g., ACTION=

"emit"+OBJECT= "magnetic film") are not deleted from the expanded search queries –

which is a significant departure from the *validation section* and *validating* of claims 1 and

11.

In addition, the WordNet dictionary cannot be considered as SAO KB for

validation of search queries, due to the fact that in WordNet there are no structures

allowing one to validate the combination of action and object. Only word-to-word

expansion is used from WordNet: synonyms (see *Bhandari* Col. 7, lines 18-20, 24-25)

and a-kind-of relations (see *Bhandari* Col. 7, lines 29-30). In the present invention, the

aim of using SAO KB is validation of expanded SAO combinations (see *Present*

Application [0064]) – this is not taught in Bhandari.

For all of these reasons, Bharandi does not teach or make obvious the *expansion*

section or *validation section* of independent claim 1, nor the corresponding elements of

independent claim 11, or any of their respective dependent claims.

Messerly

Messerly does not teach or make obvious the following portion of the expansion

section of claim 1 cited in the Office Action, or the corresponding element of claim 11:

> wherein the expansion section interacts with an action
> dictionary of synonyms that includes a list of "verb-noun"
> expressions that are synonymous with other verbs

According to the examples (see *Present Application* [0026]) "verb-nouns"

expressions synonymous with other verbs are used to enrich the methodology of word-to-

word synonymous (and other) expansion in search query by using additional synonymous

expansion for constructions like SAO: ACTION+OBJECT = ACTION (increase

temperature = heat).

In contrast, Messerly obtains only word-to-word synonyms for expansion (see Messerly, Fig. 12, element 1200): "((man OR person), (kiss OR touch), (pig OR swine OR animal))." Thus, taking an example similar to those in the present application, for the query "increase temperature of water" parsed as "(increase), (temperature of water)," Messerly will obtain only "(increase OR rise OR augment ...), ((temperature OR T OR warmth OR ...) of (water OR H20 OR ...))" without obtaining the additional expanded query "((heat), (water))" produced by the present invention. This could only be obtained as a result of application of synonymy patterns based on considering the possibility to change the structure of the query, as done with the present invention. Thus, Messerly does not teach or make obvious the cited portion of claims 1 or 11 related to query expansion.
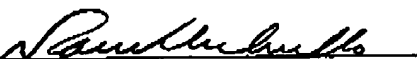
Conclusion

As stated above, the combination of Bhandari and Messerly is improper. Beyond this, even if combined, Bhandari and Messerly to do not teach or make obvious each and every element of independent claims 1 and 11. Therefore, the Applicant respectfully requests removal of all rejections under 35 USC §103 of claims 1, 2, 4-12, and 14-24.

Applicants believe that the present application is in condition for allowance. A Notice of Allowance is respectfully solicited. Should any questions arise, the Examiner is encouraged to contact the undersigned.

Respectfully submitted,

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